2011 Military Health System Conference

En Route Critical Care

EVOLVING, IMPROVING & ADVANCING CAPABILITES

The Quadruple Aim: Working Together, Achieving Success

Colonel Beverly Johnson

26 Jan 2011

Headquarters Air Mobility Command
Surgeon’s Office

En Route Critical Care

- Evolution of Critical Care Air Transport
  - Taking Aeromedical Evacuation to Higher Levels
- Improving Care Across the Continuum
  - System within a System
- Advancing Capabilities
  - Closing Gaps in the Continuum
  - Building Partnerships
  - Research, Training and Technology

EVOLUTION OF ENROUTE CRITICAL CARE

In the Beginning… Patient Evacuation World War II

Point of

Battalion Aid
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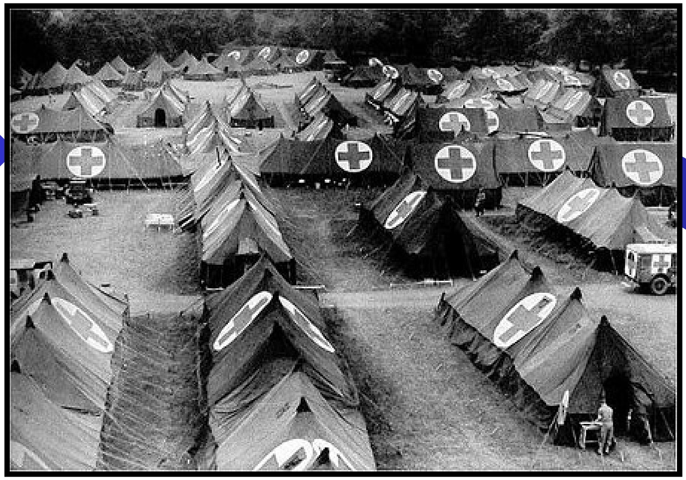
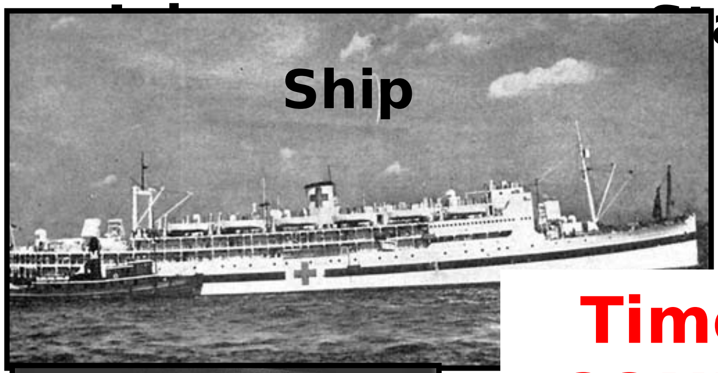


Field Hospital



Ship

Time to CONUS: <90 days via Ship & Ground

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General Hospital

Enter Air Evacuation

- AE System Organized
  - Despite resistance – prove
  - High Volume System for Patient Movement
- Airlift
  - Initially denied use of aircraft
  - Sporadic use of airlift
- Medical Care in the Air
  - Formal Flight Training
  - Flight Surgeons at Airheads
  - Nurses & Med Techs Inflight

World War II

Korean Conflict

Vietnam

Dedicated Airlift

- C-9 Nightingale
- Integrated Patient Support
  - **Oxygen**
  - Suction
  - **Electrical**
  - Special Care Area
  - Ramp
  - Medical Supplies
  - **Cooking Facilities**
- Limited Range
- Peacetime and Contingency
- Utilized for 30+ years

Continuous En-Route Care:
Stable Patient

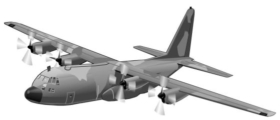
Historical Perspective

CASUALTY EVAC

- **Evac Policy - 1 Day**

Battalion Aid Station "Level 1"

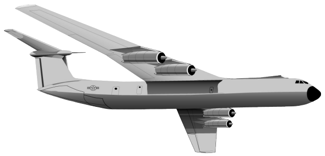
Field Hospital "Level 2"



TACTICAL EVAC

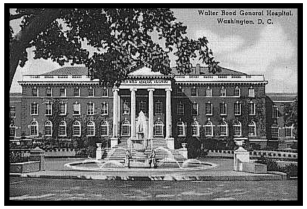
- **Evac Policy - 7 Days**

In Theater Hospital "Level 3"



STRATEGIC EVAC

- **Evac Policy - 15 Days**



Definitive Care "Level 4"

Critical Care Air Transport Begins

- 1988 Gen PK Carlton II presents idea
- 1994 Pilot Unit Stood Up
- 1995 First 6 months
  - Teams managed 20+ critical patients
  - Combat missions/trans-Atlantic missions
  - Supported non-combatant evacuation from Liberia
  - Supported Khobar Towers bombing victims

More than War-time Capability

Civilian Air Crash
Guam

MacKay Trophy 2000

Proof Of Concept

Enroute Critical Care Saved Lives

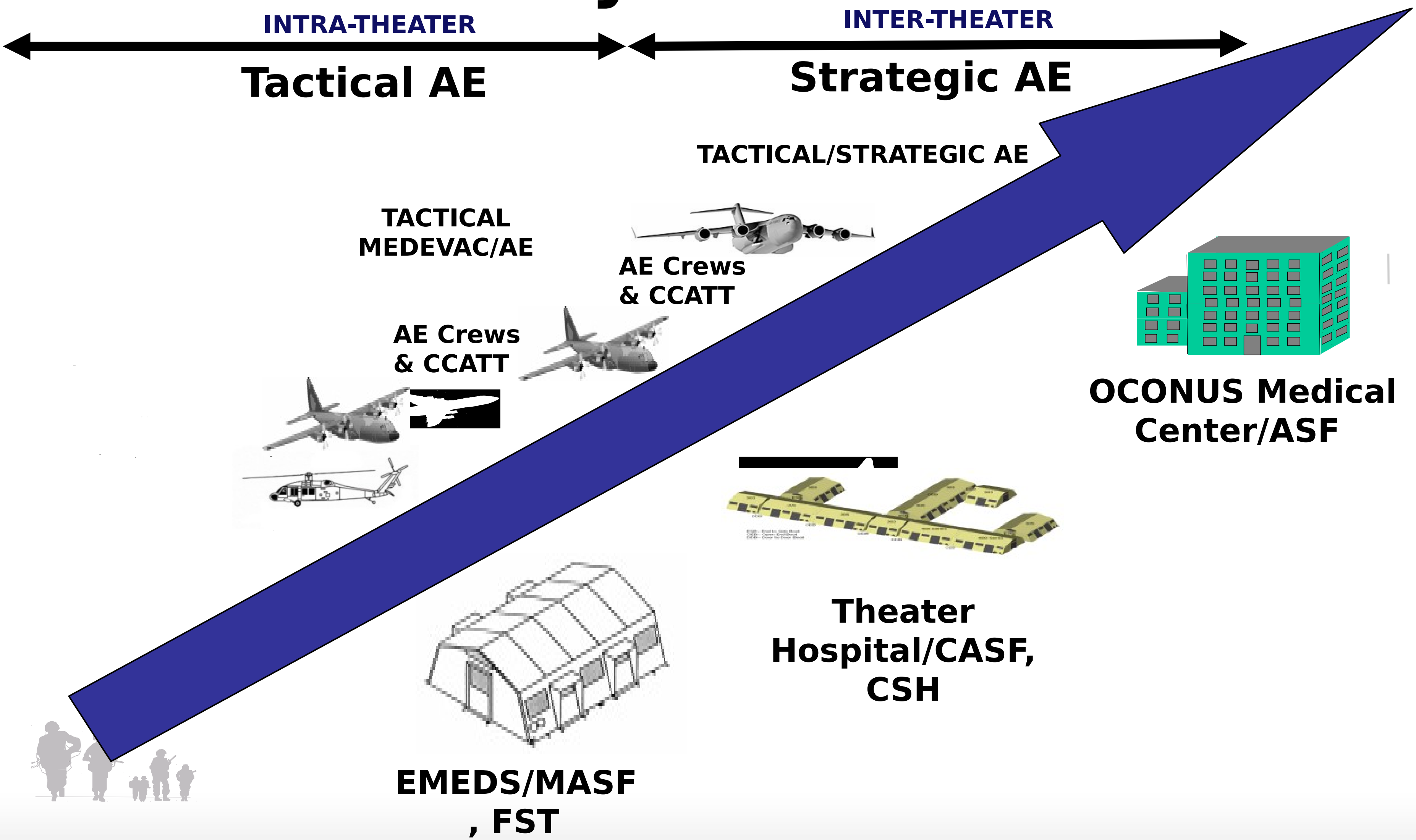
Continue to Save Lives

IMPROVING CARE ACROSS THE CONTINUUM

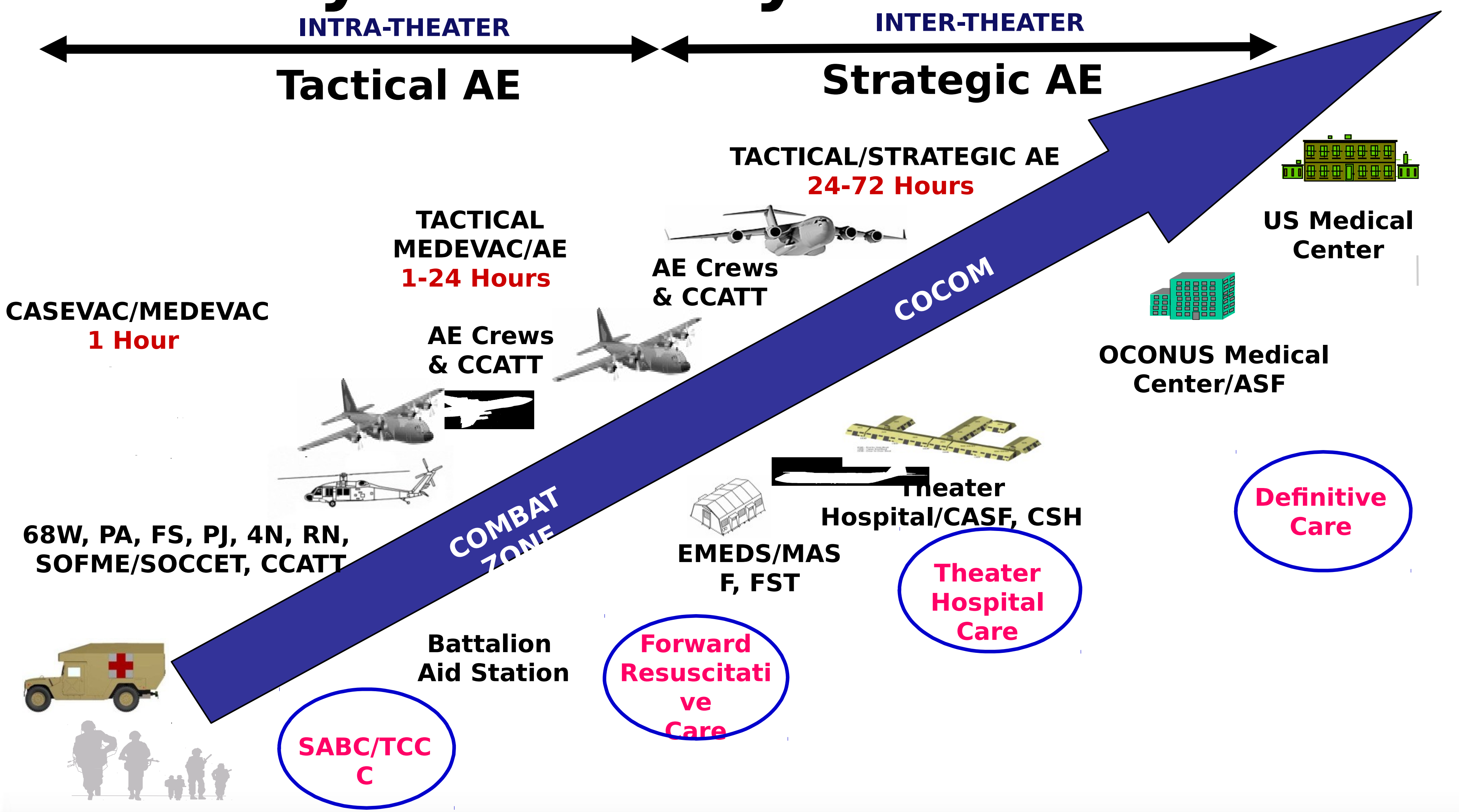
Transformation

- AE is no longer transporting stable patients between two MTFs
- Care in air equal or higher than that on ground
- Care that is started on the ground will continue until final destination
- Patient Driven Special Teams
  - Critical Care Air Transport
  - Neonatal Intensive Care
  - Burn Team
  - Acute Lung Team

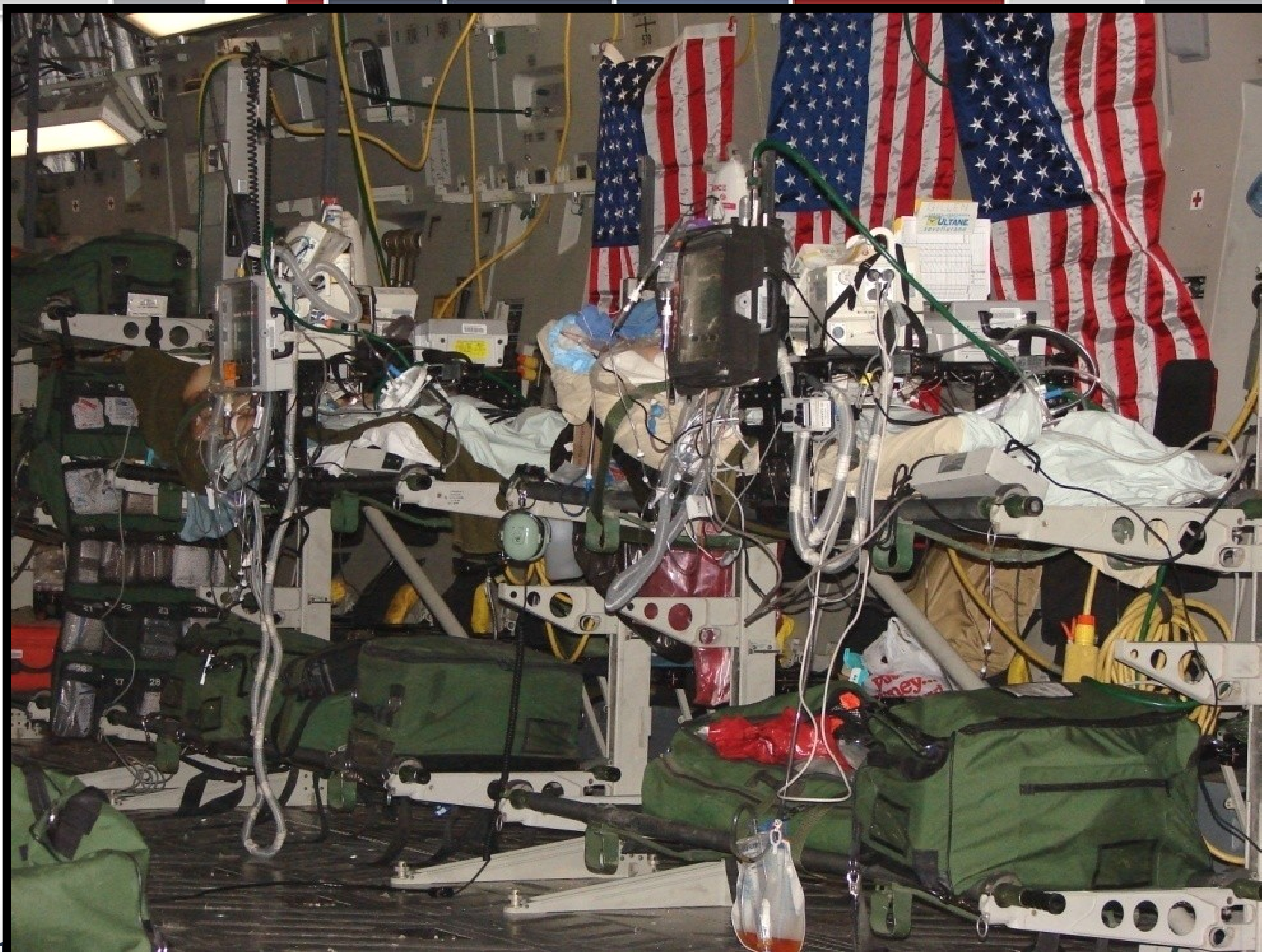
CONTINUOUS EN ROUTE CARE:
AE System



CONTINUOUS EN ROUTE CARE:
System of Systems



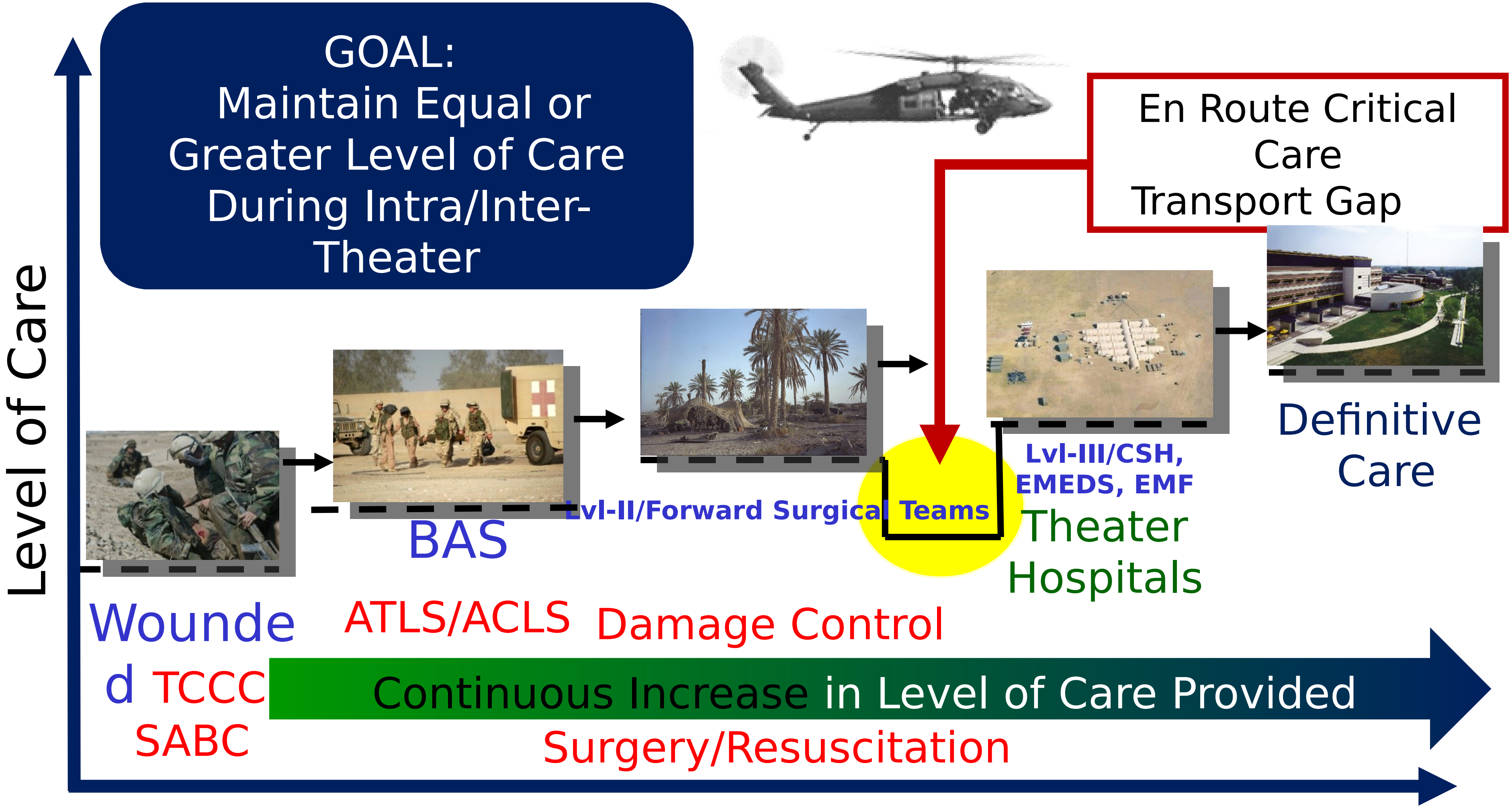
Ability to Move “Stabilizing” Patients



Without It…System Failure

ADVANCING CAPABILITIES

INTRA-THEATER CRITICAL CARE TRANSPORT GAP



BACKGROUND
Current Lvl-II to Lvl-III Patient Movement

CONCERN

- Lowest Ever “Died Of Wounds Rate” Largely the Result of Integrated En Route Care “System of Systems”

- GAP: Ad Hoc Intra-Theater Movement of ICU-Level Patients Utilizing Assets Not Specifically Organized/Trained/Equipped for Critical Care Patient Movements

TACTICAL CRITICAL CARE EVACUATION TEAM (TCCET)

TCCET Personnel/Training

<table>
<tr><th></th><th>AFSCs/Experience</th><th>Medical Training</th><th>Operational Req’t/Training</th></tr>
<tr><td>Nurse</td><td>• 46M3 CRNA
• SUBS: 46N3E Critical Care*
46N3J Emergency Room*

* Experience:
Active ICU/Critical Care or ER (US Level 1-2 Trauma Center)</td><td>• BLS/ACLS
• ATLS/PALS
• TNCC or ATCN
• CCATT/CSTARS-C
• Joint En Route Care Course (JECC)</td><td rowspan="2">• Operational support physical

• Combat Skills Training (CST)

• SERE 100, HRC

• RW ops familiarization incl. night ops (low light & blackout conditions, NVG use, etc.)…JECC</td></tr>
<tr><td>Provider</td><td>• 44E3A Emergency Dept Physician*
• SUBS:
45A3 Anesthesiologist*
44M3 Internal*
48R Residency Trained Flight Surgeon*

* Experience:
Active ICU/ER/Critical Care</td><td>• BLS/ACLS
• ATLS/PALS
• CCATT/CSTARS-C
• JECC</td></tr>
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MEDICAL EQUIPMENT

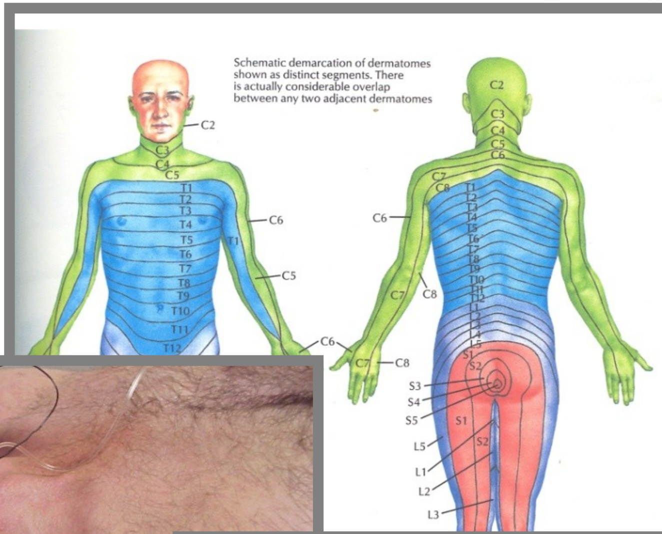
- Lightweight, Modular, Grab-n-Go Medical Supplies Approaching ICU Level Care
  - Rotary Wing or Fixed-Wing
  - Tight, Austere Environs
  - AFSOC & CCATT Equipment
- Personal Protective Ensemble

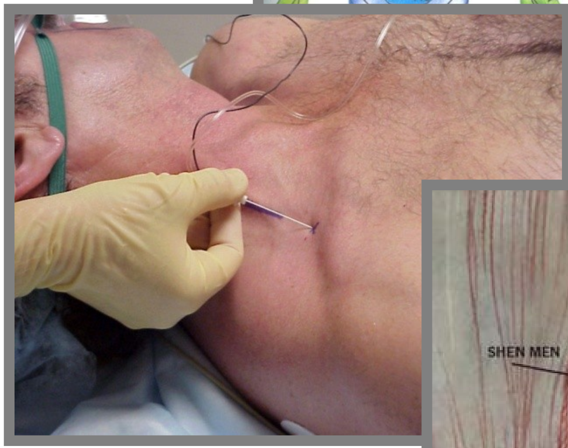
TCCET SUMMARY

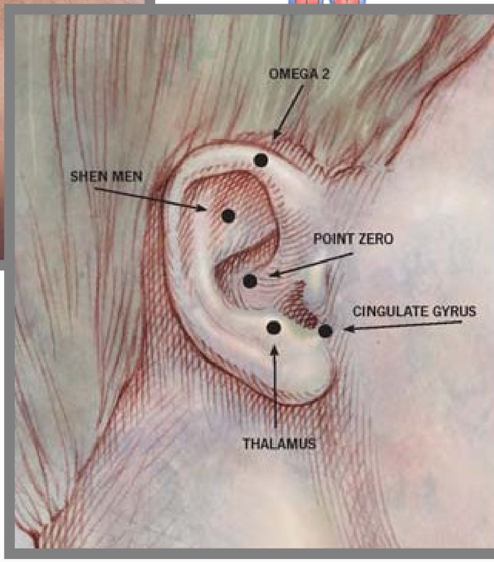
- Current Ad Hoc Solutions Result in Non-Standard Level of Care
- Intra-Theater Movement of ICU-Level Patients
  - Presents Option for Care Gap in Non-AE Missions Lvl-II to Lvl-III
  - Must be Driven by Clinical Requirements
- TCCET Developed to Fill Care Gaps and Augment CCATT
- 6 AF Personnel (2 Teams) & Equipment being prepared for summer deployment

Pain Management

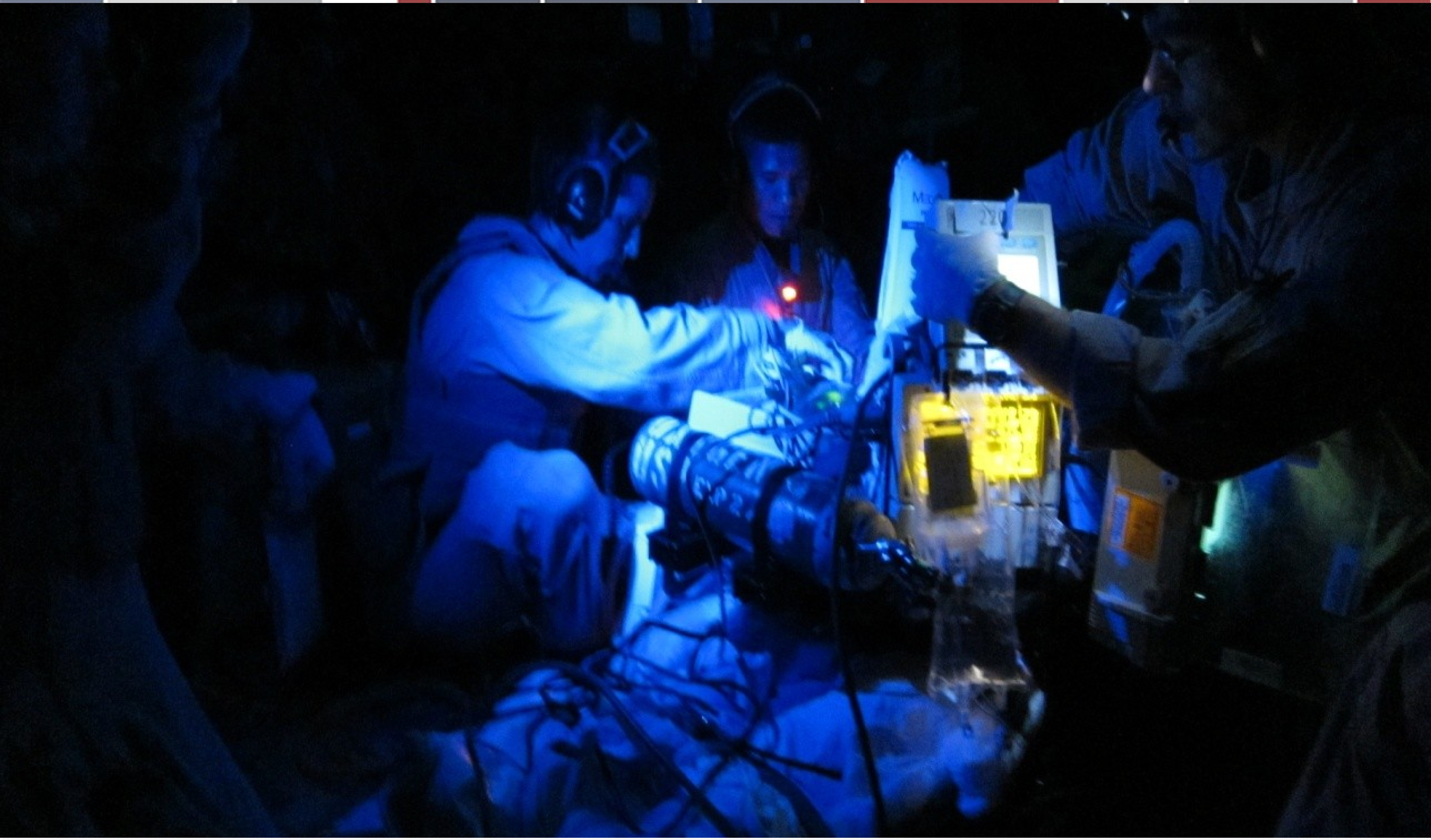
- Epidural Management
- Regional Blocks
- Narcotic Administration
- Acupuncture
  - Feasibility Study Jan 11







Expanding Global En Route Care

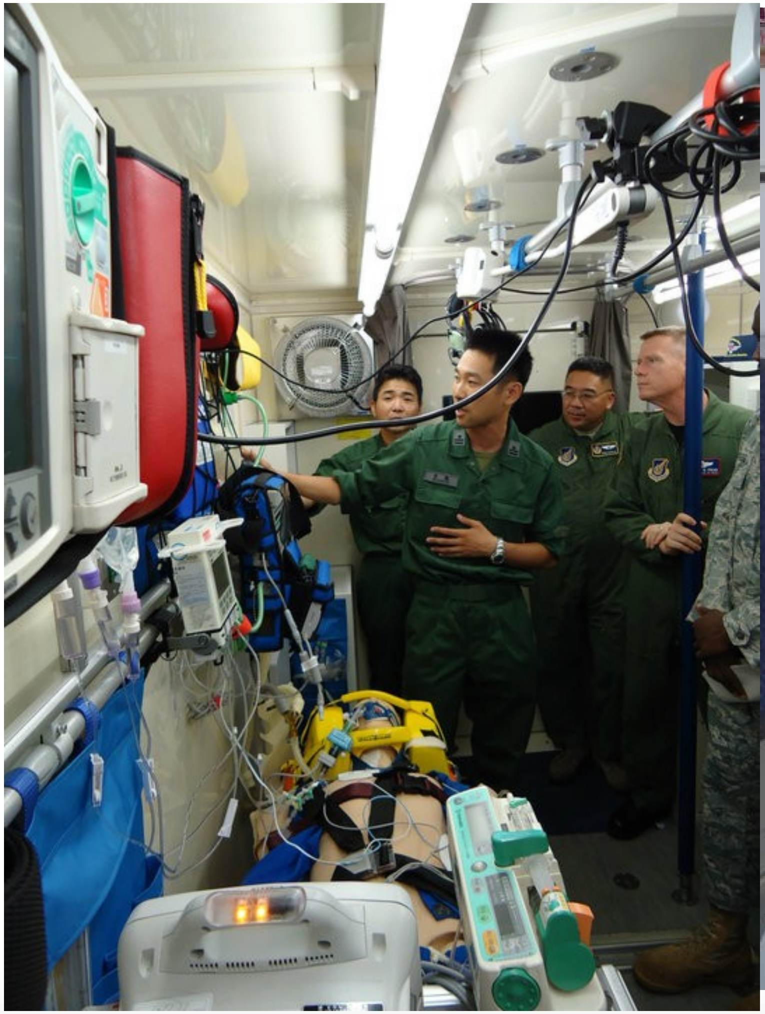


AE InterFly: Advancing Interoperability

Air and Space Interoperablity Council

- Mission: Working together to advance global AE response
- Focus areas
  - Medical Equipment
  - Clinical Capabilities
  - Command and Control
  - Doctrine
- Goals:
  - Publish Guidance on each nations capabilities
  - Exercises that demonstrate AE/Critical Care

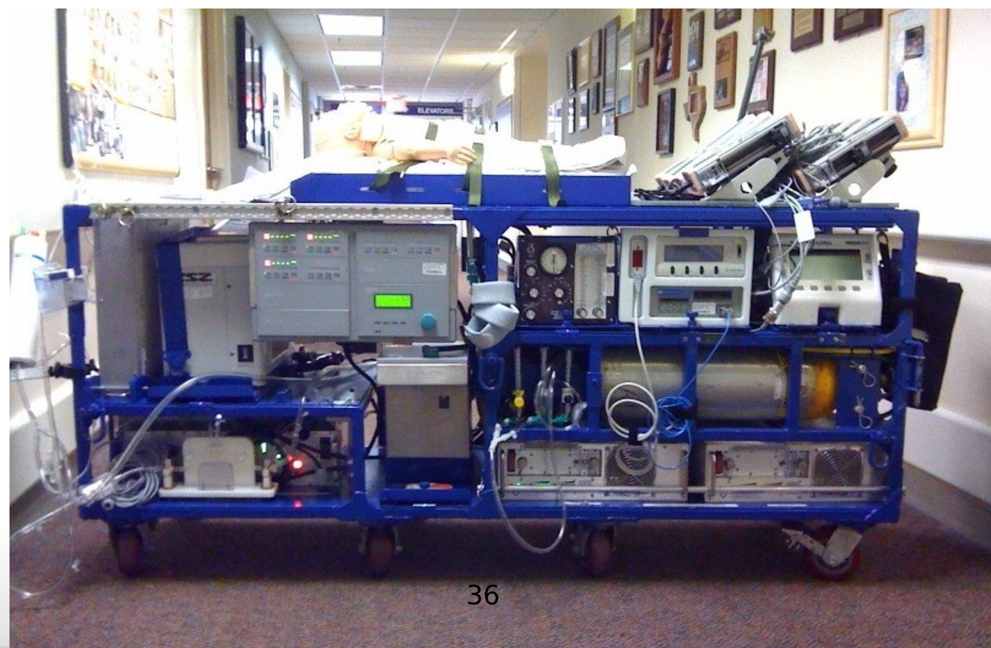
Building International Partnerships



Civilian Partnerships

KAPI'OLANI MEDICAL CENTER FOR WOMEN & CHILDREN
An Affiliate of Hawai'i Pacific Health

- ECMO Pediatric/Neonatology Consortium
- 58 y/o Male unresponsive to care
- Needed Adult ECMO
  - USA ECMO MD
  - USAF Neonatologist
  - Civilian Perfusionist
  - Civilian ECMO RN
- Transported to Iowa



International AE En Route Medical Care Conference

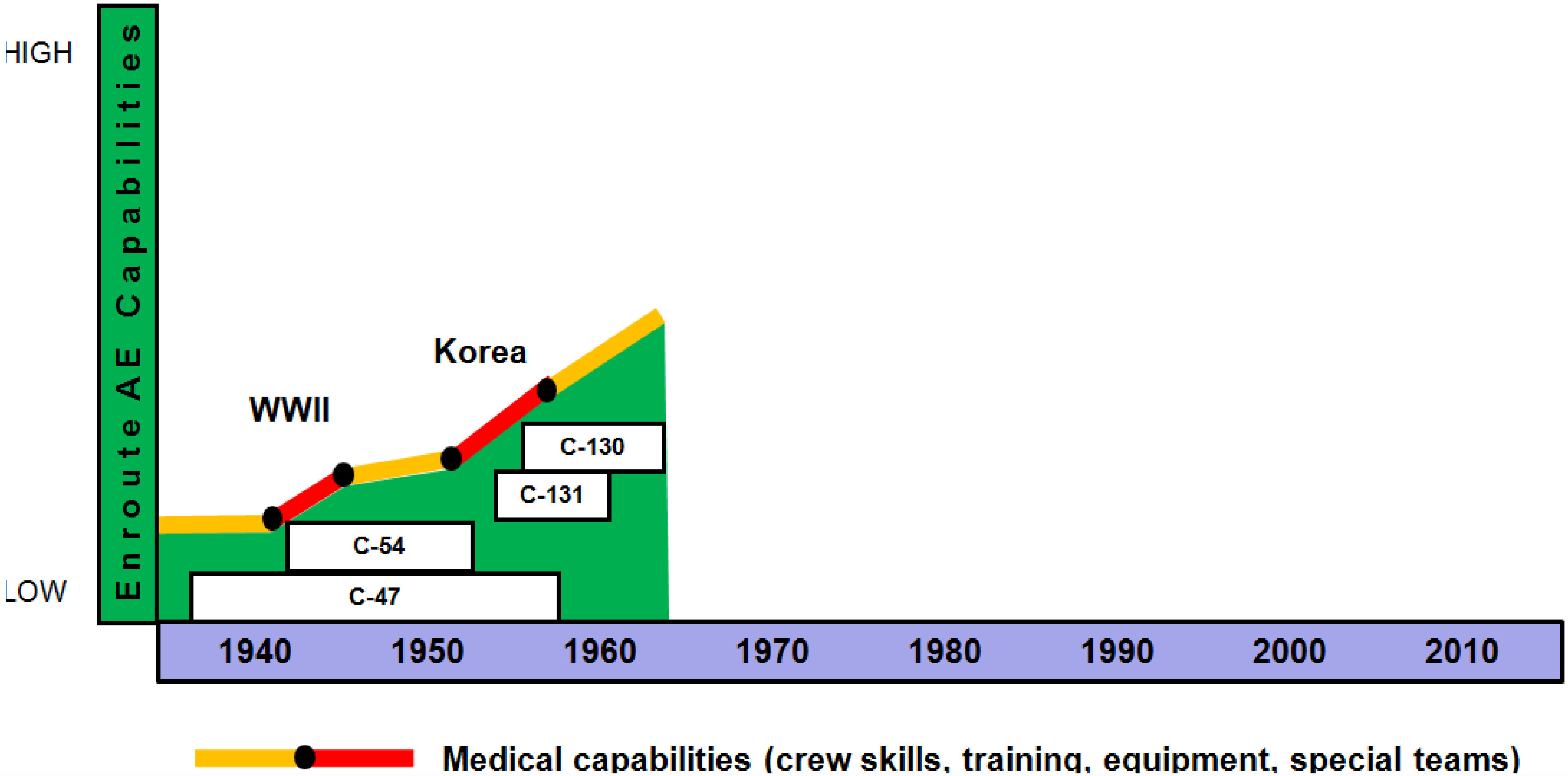
20-21 July 2011
Joint Base McChord, WA

<u>Target Audience:</u>
Aeromedical evacuation, patient transport and critical care teams from any nation

This multinational consortium will allow nations to share advances in patient transport to include clinical management of patients, clinical and aircrew training platforms and new technology used to support patient care.

Aircraft Modernization

An aircraft's ability to support rapidly developing medical capabilities is vital to continued advancement in En Route Care



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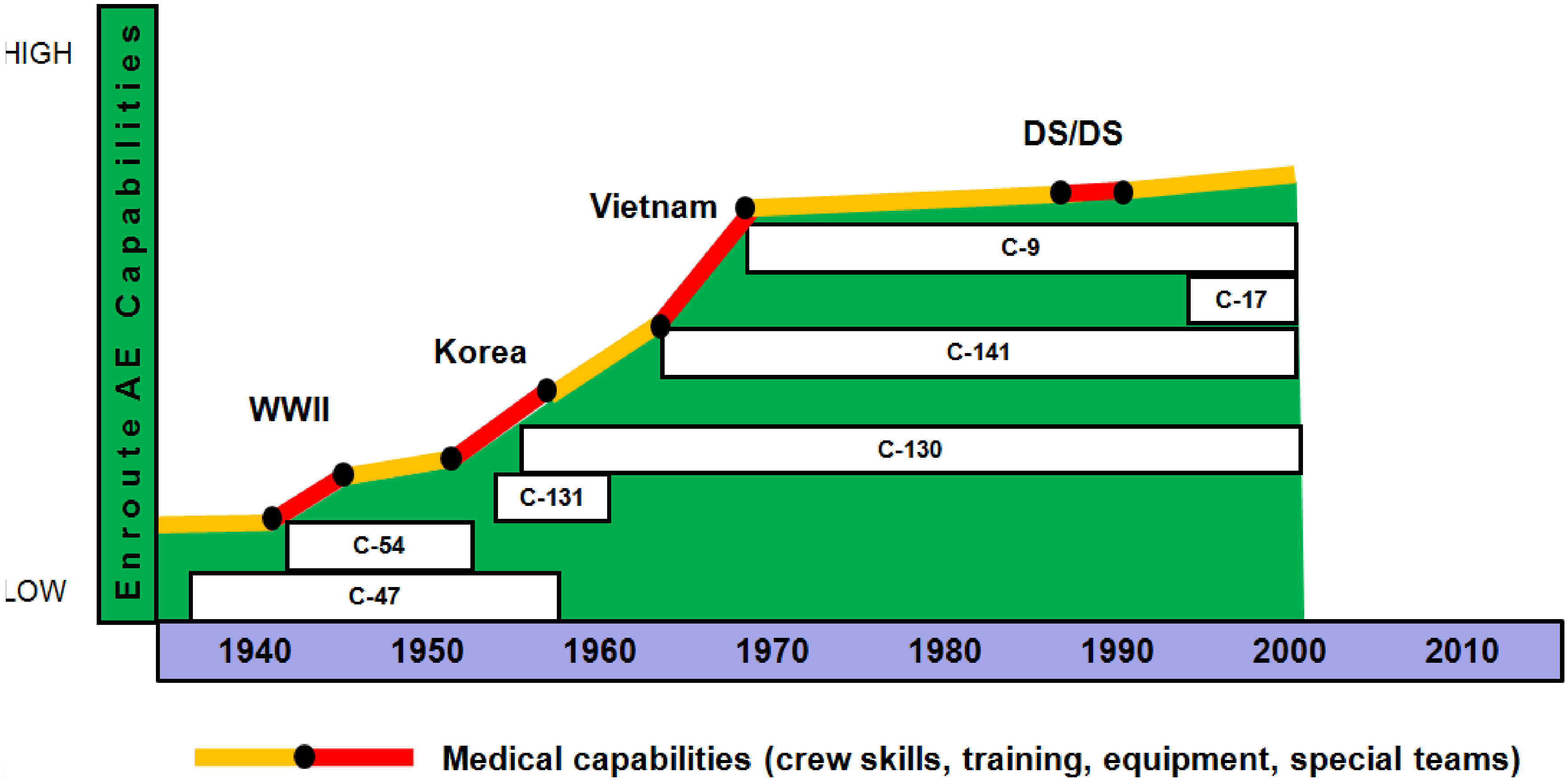

Clinical + Aircraft = Capabilities[10]

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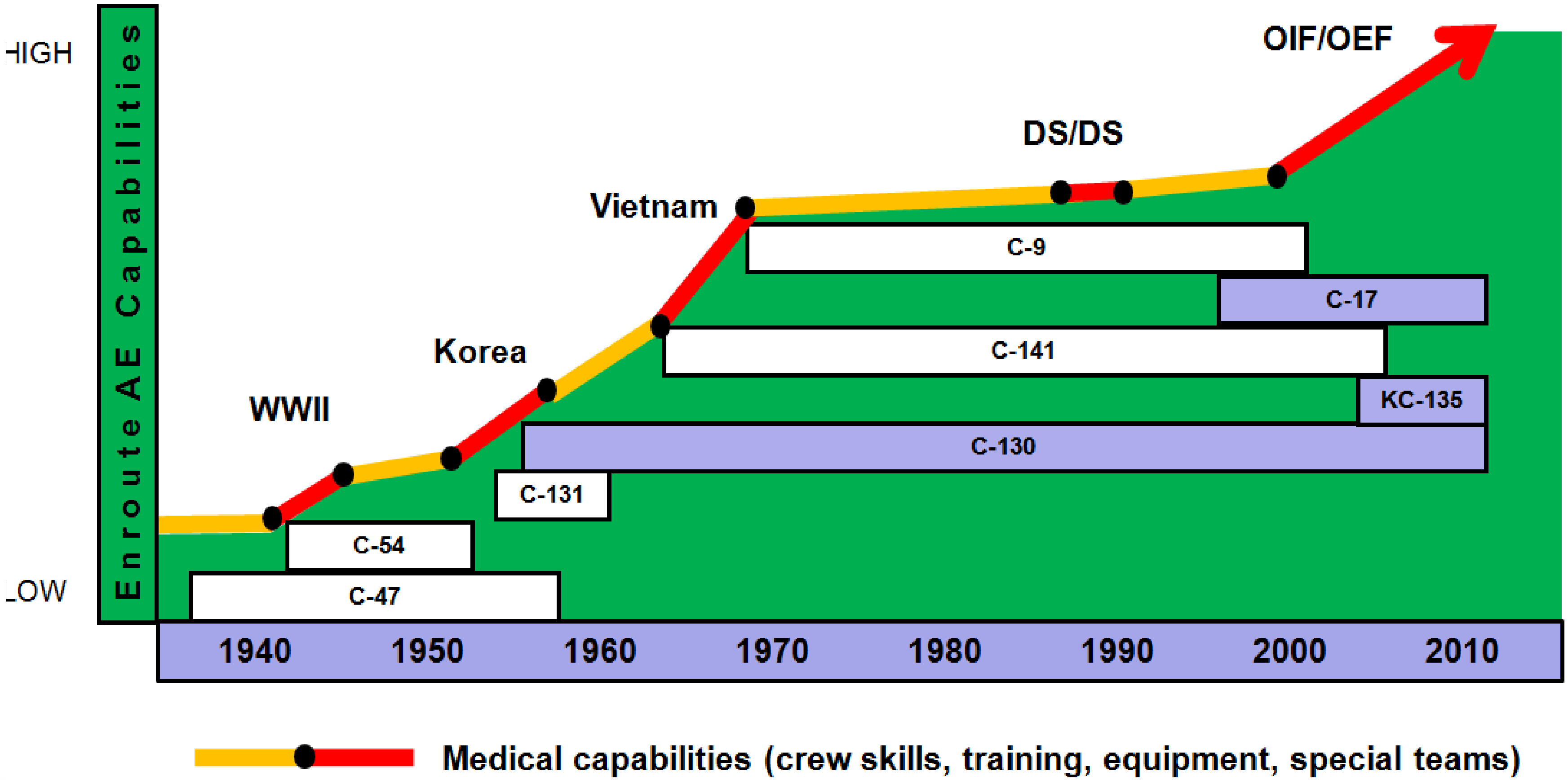

Aircraft Design and Acquisition

Clinical and Aircraft Capabilities

AE Support Requirements

Mission	Patient
▪ Loading ▪ Configuration ▪ Systems ▪ Communication	▪ Environmental ▪ Therapeutic oxygen ▪ Electrical ▪ Tele-Health (Future)

Incorporate AE support requirements into aircraft design

Research, Training and Technology

En Route Care

The Future is Now……

Questions